

LEAD INDUSTRIES ASSOCIATION

66 EAST 42ND STREET

NEW YORK 17, N. Y.

Plus 1 and 8

September 17, 1939

SUBJECT: RED LEAD TECHNICAL
LETTER NO. 14

To Members of the Lead Industries Association:

A copy of our new Red Lead Technical Letter No. 14 - L.I.A.
FORMULA 328, A RED LEAD-CORROSIVE PRIMER is enclosed.

Approximately 12,000 copies are being distributed to
individuals in the following groups:

Shipyards
Highway Engineers
Construction Companies
Paint Production Clubs
National Paint Varnish and Lacquer Association
Water and Sewage Works
Railroads
Miscellaneous

Additional copies of Red Lead Technical Letter No. 14 are
available for the use of members upon request.

Sincerely yours,

W. L. Ziegler
Secretary



L.I.A. Formula 328
A RED LEAD-COUMARONE PRIMER
FOR SEAWATER IMMERSION

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Lead Pigments Technical Committee
LEAD INDUSTRIES ASSOCIATION
60 EAST 42ND STREET
New York 17, N. Y.

Foreword

IN 1943 the Lead Industries Association initiated a series of tests comparing anticorrosive paints and primers for ship hulls. After a thorough preliminary screening, some of these paints were given full-scale "service tests" by the Navy in a continuing program designed to find and develop new coatings with improved service potential and economy. These service tests, carried out on the hulls of three U. S. Destroyers, were recently completed. On the basis of test results, red lead-coumarone primer (L.I.A. #223) appears to have performed comparably to the more expensive #14N (MIL-P-19453) coating which is the Navy standard for ship bottom service for anti-fouling systems other than vinyl.

On one of the three ship bottoms, it was found that the red lead primer affords protection that is equal or very slightly better than Navy standard anticorrosive #14N. In a second case the red lead primer was judged to be slightly inferior (average merit score of 93.5 vs 94.5). And in the third case no significant difference in performance between red lead primer and #14N was discernible.

This type of primer should be applied to thoroughly cleaned surfaces for best performance. In these tests, the bottoms were sandblasted to bare metal. A slight improvement in overall performance was noted when the bare surface was treated with Navy Formula No. 117 pretreatment before priming.

Additional information on this paint formulation or other specific paint problems can be obtained from the Lead Industries Association or from the designated individuals in the member companies listed below:

THE SUMNER HILL COMPANY 640 Market Street, San Francisco 4, California
1234 14th Street, Oakland 7, California
2101 Yates Avenue, Los Angeles 22, California
2700 14th Avenue Southwest, Seattle 4, Washington
For technical information write R. E. Sharr, Chemical Products Division,
640 Market Street, San Francisco 4, California.

THE EAGLE-PICHER COMPANY American Building, Cincinnati 1, Ohio
For technical information write Paul Whitford, Research Dept. P. O. Box 790 Apple, Mo.
Chicago 2, Cincinnati 1, Cleveland 13, Dallas 26, Kansas City 6, (Mo.), New
York 17, Philadelphia 4, Pittsburgh 22, New Orleans 12, Atlanta.

THE GILBERT COMPANY 1790 Union Commerce Building, Cleveland 14, Ohio
For technical information write Aceto long at above address.
Atlanta, Boston, Minneapolis, New York, South Hackensack (N. J.), San
Francisco; Adams & Elting Division, Chicago; American Paint Works Divi-
sion, New Orleans; Campbell Paint & Varnish Division, St. Louis; Hubbs
Paint & Varnish Division, Chicago; A. Wilhelm Company Division, Reading;
Canadian Division, Toronto; Chemurals, Pigments & Metals Division, Balti-
more, Collinsville (Ill.), Hammond (Ind.); Eastern Lead Company, Scranton.

HAMMOND LEAD PRODUCTS, INC. 11271 Madison Avenue, Hammond, Ind.
620 Lexington Avenue, New York 17, N. Y.
60 E. Main Street, Carleagh, Pa.
For technical information write R. E. Sharr at Hammond, Ind.

NATIONAL LEAD COMPANY 111 Broadway, New York 6, N. Y.
For technical information write R. P. Gatto at above address.
Atlanta, Buffalo 2, Chicago 2, Cincinnati 2, Cleveland 12, Dallas 2, Philadel-
phia 25, Pittsburgh 12, St. Louis 1, San Francisco 16, Boston 6, Charleston
25 (W. Va.), Seattle 4, Los Angeles 26.

WESTERN LEAD PRODUCTS COMPANY 6836 S. Pauline Way, Los Angeles 22, California
2040 Third Street, Berkeley 1, California
For technical information write Francis A. Mac at Los Angeles, California.

L.I.A. Formula 328

A RED LEAD-COUMARONE PRIMER FOR SEAWATER IMMERSION

FUNDAMENTALLY, the coating system described here consists of a red lead anticorrosive primer and a finish coating of either hot or cold plastic. For best performance of the coating, surfaces must be thoroughly cleaned and dry at the time of application. Sandblasting to the bare metal before painting is recommended.

While a metal conditioning coating prior to priming is not mandatory, there is some evidence that performance of the coating system is slightly improved when the bare metal is so treated. The Formula No. 117 pretreatment (Military Specification MIL-C-15328, available upon request to the C. O., Naval Aviation Supply Depot, 5801 Tabor Avenue, Philadelphia, Pa.; attention Code CDS) was applied in a thickness of 0.3 to 0.5 mils in the tests on three U. S. Destroyer hulls. As the name implies, the surface preparatory coating is intended to condition the metal surface and insure a firm bond between it and subsequent coats of paint.

Where no metal conditioner is used, the red lead primer is applied directly over the clean, dry metal surface. In either case two or three coats of the primer should be applied to reach a minimum dry film thickness of 8 mils. Records in the Bureau indicate the primers were "applied in three coats." Normal application is by spray rather than brush. In applying the primer, a minimum drying period of six hours should be allowed between coats and six hours before the anti-fouling paint.

A variety of anti-fouling coatings are in current use for ship bottoms and similar service. Cold plastic coating No. 106 (MIL-P-19451) and Hot plastic No. 15 HPN (MIL-P-19452) were used in Navy tests. Others include Maritime Commission coal tar-resin anti-fouling coating 52-MC-408 and Bureau of Ships Formula No. 121, a vinyl anti-fouling coating (MIL-P-18931). Less is known about the compatibility of the system, L.I.A. 328/BuShips 121, and the system should not be used without prior tests.

Formulation of L.I.A. 328¹

Composition	Percent	Pounds	Gallons
PIGMENT: Red Lead (TT-R-191, Type I, Grade 97)	47.0	322	4.51
Zinc Oxide (TT-Z-301)	8.3	58.1	1.24
Zinc Yellow (TT-Z-415, Type I) ..	8.3	62.5	2.06
Mica, 325 Mesh (MIL-M-15176, Type I)	8.3	58.1	2.46
Magnesium Silicate (M-M-323, Type I)	27.2	193	8.97
Aluminum Stearate (MIL-A-15206)	0.4	3.1	0.37
	<u>100.0</u>		
VEHICLE: Coumarone-Indene Resin (M.R. 127-137°C) ²	25.4	166	18.12
Coumarone-Indene Resin (M.R. 5-15°C) ³	2.7	57	6.22
Liquid Coal Tar (MIL-T-15194) ..	2.3	58.1	5.57
Zinc Resinate ("Zinar" or equiv.)	2.2	20.8	2.17
Chlorinated Rubber 20 Centipoise Viscosity ("Parlon" or equiv.)	6.3	41.5	2.06
Hi-Flash Naphtha (MIL-N-15178, Type A)	31.7	208	22.50
Aliphatic Petroleum Spirits (B.R. 205-280°F)	15.0	98.5	16.00
Pine Oil (LL-O-338)	0.8	5.2	0.57
	<u>100.0</u>	<u>1260.6</u>	<u>100.00</u>

Pigment—51.9%; Vehicle—48.1%; Wt./Gal.—12.6 lbs.; PV—85%.

1) First described in Red Lead Technical Letter No. 2, July 1946 as "Formula 3-S" (out of print).

2) This vehicle may be prepared by heating the coumarone resins and liquid coal tar together to a temperature of 445°F, adding the zinc resinate and holding temperature until it is all melted in. All of the petroleum spirits and 80 gallons of the required Hi-Flash naphtha may then be added. The chlorinated rubber can then be dissolved into the remaining Hi-Flash naphtha at room temperature. The chlorinated rubber should be blended in with the remainder of the ingredients only after the coumarone-coal tar-resinate mixture has cooled to 160°F or less. To avoid decomposition, the chlorinated rubber should never be heated above 160°F.

Although the above method is preferred, the vehicle may also be prepared by cold cutting the indicated ingredients.

3) A coumarone-indene resin with a melting range of 127-137°C.

4) A coumarone-indene resin with a melting range of 5-15°C.

Note: Only dark colored finishes should be applied over this primer since bleeding through of the coal tar may occur. However, this does not affect its protective performance. In applying these paints in confined areas, adequate ventilation is necessary to prevent accumulation of explosive vapors and to protect the operator.

Although the formulations contained in this Technical Letter have been established by our Lead Pigments Technical Committee through careful evaluation, no guarantee of results is made or implied. Users are urged to make additional confirmatory evaluations to meet their specific requirements.

The Lead Industries Association and its member companies will be glad to give further information on paints for marine exposures or to assist on other paint problems.